to be a parabola for the sake of simplicity, and the following observation made by Herr Palisa at Vienna being used :—

August 27, 15h. 27m. 12s. Vienna M.T.
R.A. = 8h. 42m. 55·71s., Decl. 29° 34′ 24″·7 N.

Ephemeris for Berlin Midnight.

1887.	R.A. h. m.	Decl. ° ′	Log *r*.	Log Δ.
September 5	9 21·1	30 16 N.	0·120	0·311
9	9 39·7	30 20	0·112	0·304
13	9 58·8	30 16	0·105	0·297
17	10 18·4	30 2 N.	0·099	0·291

THE MORRISON OBSERVATORY.—The first number of the publications of the Morrison Observatory, Glasgow, Missouri, U.S.A., has just appeared. This Observatory was founded, in 1875, by the liberality of Miss Berenice Morrison, and possesses an equatorial refractor by Alvan Clark, of 12¼ inches aperture, and a transit-circle by Troughton and Simms, with objective of 6 inches aperture and 77 inches focal length, the circles being 24 inches in diameter. In this first volume Prof. C. W. Pritchett, the Director, gives a history and description of the Observatory, with an account of the determination of the longitude and latitude of the meridian pier, besides a selection of such observations and notes made at the Observatory as are likely to be of use to astronomers. These latter include measures of double stars, observations of occultations, of the transit of Mercury, 1878, measures of the diameter of Mars, observations of comets, of Jupiter and Saturn, and of the figure and dimensions of Uranus. Prof. Pritchett's work appears to have been seriously crippled through lack of means, and, considering the excellent use which he has made of the resources at his command, it is to be hoped that he may speedily find himself in a position to carry on the operations of the Observatory on a more extended scale.

NEW OBSERVATORY AT JUVISY.—The current number of *L'Astronomie* contains a description of a new Observatory belonging to M. Camille Flammarion, which has just been completed. An admirer of M. Flammarion had presented him some five years ago with a little chateau and park situated on the road from Paris to Fontainebleau of historic name and interest. The house, which was built in 1730, possessed walls so thick and solid as to serve as a perfectly stable base for the equatorial and dome with which M. Flammarion has surmounted it. The dome is 5 m. in interior diameter, and covers an equatorial by Bardou of 0·24 m. aperture and 3·75 m. focal length, with clockwork by Bréguet, furnished with a Villarceau governor. Two smaller telescopes—one by Secretan of 108 mm. aperture, the other by Foucault of 160 mm., stand on the adjoining terrace. The Observatory, the co-ordinates of which are East longitude from Paris 0h. 0m. 8s., N. latitude 48° 41′ 36″, commands an uninterrupted horizon, and an atmosphere noticeably purer than that of Paris.

THE TOTAL SOLAR ECLIPSE OF AUGUST 19.—We learn from the current number of *Ciel et Terre* that M. Niesten, of the Brussels Observatory, was fairly successful in his observations of the eclipse. It had been his intention to push on as far east as Perm, but a delay in the arrival of his instruments led him to accompany M. Belopolsky to Jurjewitz on the Volga. The sky was cloudy here as at most of the other stations, but cleared a little round the sun at the time of totality, and M. Niesten was able to see the chromosphere and prominences, and the appendices of the corona, and his assistant secured eight photographs, of which six were good. The exposures varied from 8 seconds to half a minute; the chromosphere and prominences were shown on all, and two gave traces of the corona and also of Regulus, which was near the sun. M. Karinne, a Moscow photographer of the same station, also secured several photographs. A drawing which M. Niesten made of the corona showed a strongly-marked coronal ray, about a degree in length, in the direction of the solar equator.

MINOR PLANET No. 267.—M. Charlois, of Nice, who discovered this object, has named it Tirza.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 *SEPTEMBER* 11-17.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on September 11

Sun rises, 5h. 30m.; souths, 11h. 56m. 36·1s.; sets, 18h. 24m.; decl. on meridian, 4° 35′ N.: Sidereal Time at Sunset, 17h. 46m.

Moon (New, September 17, 14h.) rises, 22h. 27m.*; souths, 6h. 22m.; sets, 14h. 22m.; decl. on meridian, 19° 12′ N.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m.	Decl. on meridian. ° ′
Mercury	5 28	12 1	18 34	5 48 N.
Venus	7 23	12 40	17 57	9 9 S.
Mars	1 43	9 29	17 15	18 55 N.
Jupiter	9 46	14 48	19 50	12 1 S.
Saturn	1 8	9 0	16 52	19 47 N.

* Indicates that the rising is that of the preceding evening.

Sept.	h.	
14	2	Saturn in conjunction with and 1° 39′ north of the Moon.
14	18	Mars in conjunction with and 1° 48′ north of the Moon.
17	16	Venus in conjunction with and 12° 50′ south of the Moon.
17	22	Mercury in conjunction with and 2° 33′ south of the Moon.

Variable Stars.

Star.	R.A. h. m.	Decl. ° ′		h. m.	
Algol	3 0·8	40 31 N.	Sept. 11,	2 19	*m*
			,, 13,	23 8	*m*
λ Tauri	3 54·4	12 10 N.	,, 11,	3 6	*m*
			,, 15,	1 59	*m*
δ Libræ	14 54·9	8 4 S.	,, 12,	4 5	*m*
			,, 16,	19 48	*m*
U Coronæ	15 13·6	32 4 N.	,, 16,	2 34	*m*
R Draconis	16 32·4	67 0 N.	,, 12,		*m*
U Ophiuchi	17 10·8	1 20 N.	,, 11,	22 34	*m*
			and at intervals of	20 8	
X Sagittarii	17 40·5	27 47 S.	Sept. 14,	23 0	*m*
W Sagittarii	17 57·8	29 35 S.	,, 12,	4 0	*M*
U Sagittarii	18 25·2	19 12 S.	,, 14,	0 0	*m*
R Aquilæ	19 0·9	8 4 N.	,, 16,		*M*
η Aquilæ	19 46·7	0 43 N.	,, 14,	4 0	*M*
W Cygni	21 31·8	44 52 N.	,, 11,		*M*
δ Cephei	22 25·0	57 50 N.	,, 19,	2 0	*M*
			,, 15,	20 0	*m*

M signifies maximum; *m* minimum.

Meteor-Showers.

	R.A.	Decl.	
Near χ′ Orionis	88°	18° N.	Very swift; streaks.
,, 50 Aurigæ	98	43 N.	Very swift; streaks.
,, α Lyræ	282	42 N.	Swift; bright; long.
,, γ Piscium	346	0 N.	Slow; bright.

SCIENTIFIC SERIALS.

THE most interesting item of information in the *Journal of Botany* for August is the record of an addition to the flowering plants of Great Britain, in the discovery, by Mr. H. C. Hart, of the Arctic *Arabis alpina* in Skye.—Mr. Tokutaro Ito, has an interesting paper on the history of botany in Japan.

Rendiconti del Reale Istituto Lombardo, June 30.—On the normal derivatives of the potential function of surfaces, by G. Morera. This paper forms a supplement to the author's late communication (*Rendiconti*, vol. xx. Part 8) on the derivatives of the potential function of space. The extremely simple analytical method by which he succeeded in determining general conditions for the existence of those derivatives and their effective expressions has also enabled him to solve the analogous question regarding the normal derivatives of the potential function of surfaces.—On the part played by sensuous images on the development and exercise of the reasoning faculty, by Tito Vignoli. In this paper the author investigates the actual form and genesis of perceptions acquired through the senses, from the standpoint of their efficacy in developing and sharpening the intelligence of animals. The subject is treated comparatively, it being impossible to understand any act or fact of human psychology unless studied in connexion with similar manifestations in

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other animals. The general conclusion is arrived at that the impression communicated through the senses is the true instrument of intellectual progress, and that in it lies the potentiality of abstract science. Pure geometry, arithmetic, and algebra are merely the last term of abstract simplification reached by the sensuous perception in its intrinsic evolution.

In the *Nuovo Giornale Botanico Italiano* for July, Sig. P. Voglino publishes critical remarks on a number of species of Fungi belonging to the Agaricini; and Prof. Caruel gives his Annual Report of the Botanical Museum of Florence for the year 1885-86.—Prof. Delpino discusses the chemical and physiological equation of the process of alcoholic fermentation, which he considers to be more simple than it has been regarded by recent writers. Succinic acid and glycerin, which are found in the liquid after fermentation, he believes to be only secondary products of the process, which consists in the simple removal from grape-sugar of a portion of its carbon and oxygen, and its consequent reduction to the constitution of alcohol.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 29.—M. Hervé Mangon in the chair.—On tornadoes in the United States, by M. H. Faye. Some observations are made in connexion with the popular work on tornadoes recently issued by Mr. Finley, of the United States Signal Service. In reply to that writer, M. Faye maintains that tornadoes are not ascending but descending movements, being whirlwinds with vertical axes due to the different velocities of moderately elevated atmospheric currents, which, like the eddies in running waters, always descend till arrested by the resistance of the ground. They penetrate like a corkscrew through the lower strata, continually contracting and tapering to a point owing to the increasing pressure of these lower strata. Their progressive movement, mainly towards the north-east, is due to the upper currents where they take their rise, and whose mean velocity and direction they retain. Their ravages are due to the violent shock of the descending spirals against the obstructions of the ground, and their fury is not spent or diminished in overcoming these obstacles, because the source of their energy is always in the upper regions, where it is constantly renewed and transmitted to the earth by the descending motion. It is further shown that the United States comply more than any other region of the globe with the conditions most favourable for the development of these destructive cyclones.—Observations of Barnard's comet, May 12, 1887, made at the Observatory of Bordeaux with the 0·38 m. equatorial, by MM. G. Rayet and Flamme.—Determination of the longitude of Haiphong, Tonquin, by telegraphy, by M. F. La Porte. Its longitude was for the first time determined in 1874 by MM. Héraud and Bouillet, who deduced it from that of Saigon. But at the beginning of this year the meridian of Haiphong was connected with that of Hong Kong by means of the submarine cable, and from the observations taken at both extremities a mean was obtained for the cathedral of Hong Kong of 7h. 27m. 20·43s., and for the Observatory of Haiphong, 6h. 57m. 22·63s. east of Paris. For the latter point Héraud's chronometric observations had given 6h. 57m. 19·8s.—Note on a projection saccharimeter, by M. Léon Laurent. The saccharimeters already constructed by the author are of two types: the rotatory polarimeter, requiring monochromatic light; and the compensating saccharimeter, more specially adapted for sugar, and using ordinary light. The present apparatus, of which a sectional view is given, has the advantage of being adapted for use with the electric light now so generally employed in large scientific establishments.—Experiments in agricultural chemistry, by M. J. Raulin. The experiments here described were carried out last year at the agricultural station of the Rhone. Their special object was to ascertain how the disturbing influences due to the varying fertility of the soil may best be obviated. The land being disposed in three equal plots, A, B, C, the extremes A and C are treated identically, while B serves as the point of comparison for the special circumstance under consideration. Normally the fertility increases or diminishes with a certain uniformity from A to C, so that half of the joint yield of A + C would be equal to that of B if the three plots were subjected to the same treatment. The cause of error due to the inequality of the soil being thus for the most part removed, the relation of the yield of $\frac{A + C}{2}$ to that of B will express the actual influence of the circumstance under consideration. In an experiment carried on according to this method, the superphosphate and precipitated phosphate used with Dattel wheat gave a very decided increase, while the result of the application of fossil phosphates and scoriæ was somewhat doubtful.—Note on the waterspout of August 19 on the Lake of Geneva, by M. Ch. Dufour. This waterspout, formed by the collision of the west and the *vaudaire* or south wind, immediately disappeared on reaching the shore half a mile west of the Rivaz railway-station on the Swiss side. From the data supplied by various observers the author calculates its height at about 106 metres. It churned up the surface of the lake, producing an effect somewhat like that of paddle-steamers, but did no damage of any kind on the land.—M. R. Guérin presented a note on a process by means of which the question of the lunar atmosphere might be elucidated. He remarked that the diurnal motion of the moon, owing to its proper motion, is not the same as that of a star. Hence, under certain conditions, a photographic lunette would give to our satellite a sharp edge, and for a star in the neighbourhood of this edge a luminous streak. It therefore seems certain that, however attenuated may be the lunar atmosphere, the photogenic conditions will be changed at the point of contact of the two heavenly bodies, and that the streak made by the image of the star should show some trace of this change.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Animal Alkaloids: Sir W. Aitken (Lewis).—City and Guilds of London Institute Programme of Technological Examinations, Session 1887-88.—First Steps in Geometry: R. A. Proctor (Longmans).—Easy Lessons in the Differential Calculus: R. A. Proctor (Longmans).—Australian Museum; Report of Trustees.—A Treatise on the Animal Alkaloids: A. M. Brown (Baillière).—Hydrophobia: R. Suzor (Chatto and Windus).—The Glasgow and West of Scotland Technical College Calendar for the year 1887-88 (Anderson, Glasgow).—Elementos de Calculo de los Cuaterniones: V. Balbin (Buenos Aires).—Les Plantes des Champs et des Bois: G. Bonnier (Baillière, Paris).—Bench Book for Test-Tube Work in Chemistry: H. T. Lilley (Hamilton).—Notes upon the History of Floods in the River Darling: H. C. Russell.—Notes upon Floods in Lake George: H. C. Russell.—Results of Rain and River Observations made in New South Wales and part of Queensland, 1886: H. C. Russell (Sydney).—Journal of Chemical Society, September (Gurney and Jackson).

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